

I claim:

1. A gravel packing method, comprising:
  - running in a packer and a screen assembly supported by said packer;
  - inserting an assembly of a crossover that supports a wash pipe at least in part into said packer;
  - flowing gravel through the packer and the crossover and through an annular space between the screen assembly and the wash pipe to an annular region outside the screen assembly;
  - removing excess gravel in said annular space without moving the crossover and the wash pipe.
2. The method of claim 1, comprising:
  - providing a seat on said crossover to accept an obstructing object for setting the packer,
  - positioning the seat so that pressure can be built up on the obstructing object to a predetermined level without any effect from downhole pressure acting below the object on the seat.
3. The method of claim 1, comprising:
  - providing a clearance in the bore of the packer as it is set;
  - allowing a fluid column to act through said clearance during setting of the packer to exert pressure on the formation below the packer for resisting cave-ins into the wellbore.

4. The method of claim 1, comprising:

flowing fluid through said packer in a first direction to deposit said gravel in said annular region and reversing the direction of flow through said packer to a second direction to remove excess gravel from said annular space.

5. The method of claim 1, comprising:

providing at least one return port in said wash pipe;

exposing said return port to said annular space;

providing a first check valve in said return port.

6. The method of claim 5, comprising:

preventing returning fluid, flowing in said first direction, that passes through the screen assembly after leaving gravel in said annular region and entering said wash pipe, from flowing through said return port because of said first check valve.

7. The method of claim 6, comprising:

providing a second check valve in a flow path through said wash pipe;

allowing fluid, that enters a lower end of said wash pipe, in said first direction, to pass said second check valve while preventing fluid entering said wash pipe from said crossover, in said second direction, from passing said second check valve.

8. The method of claim 7, comprising:

flowing fluid in said second direction into said wash pipe;

preventing said fluid from passing out of the lower end of said wash pipe with said second check valve;

allowing fluid from within said wash pipe to pass said first check valve through said return port and through said annular space before returning through said packer carrying off at least some of the remaining gravel in said annular space.

9. The method of claim 8, comprising:

providing a seal bore in said screen assembly;

extending said wash pipe through said seal bore;

defining said annular space between said seal bore and said packer; and

selectively positioning said return ports within and above said seal bore.

10. The method of claim 9, comprising:

blocking a passage in said packer for fluid return to the surface when said return port is in said seal bore;

forcing fluid to enter the formation after depositing gravel in said annular region, when flowing in said first direction.

11. The method of claim 9, comprising:

opening a passage in said packer for fluid return to the surface when said return port is out said seal bore and disposed in said annular space;

allowing fluid flowing in said first direction to pass through said screen, enter said wash pipe past said second check valve and flow through said opened passage in said packer to the surface.

12. The method of claim 11, comprising:

reversing to said second fluid direction with said passage open in said packer and said return port in said annular space for said removal of gravel from said annular space.

13. The method of claim 11, comprising:

providing tabs on said wash pipe to engage said screen assembly for support in a first position with said return port in said seal bore and a second position with said return port above said seal bore.

14. The method of claim 2, comprising:

providing a gravel outlet from said crossover that can selectively be positioned in fluid communication with said annular space; and

locating a seat in said crossover below said gravel outlet.

15. The method of claim 14, comprising:

fixedly mounting said seat;

dropping an object onto said seat;

setting said packer with pressure built up on said seat.

16. The method of claim 15, comprising:

providing a seal bore in said screen assembly;

positioning said gravel outlet in said seal bore for said setting said packer;

moving said gravel outlet into fluid communication with said annular space to permit flow in said first direction for depositing gravel in said annular region.

17. The method of claim 16, comprising:

allowing said object to remain on said seat after setting said packer to block flow in said first direction from entering said wash pipe while directing such flow out of said crossover through said gravel outlet.

18. The method of claim 17, comprising:

allowing flow in a second direction opposite said first direction to enter said wash pipe around said seat and exit said wash pipe through a return port and into said annular space;

providing a check valve in said return port;

removing gravel from said annular space with flow passing through said check valve.

19. The method of claim 15, comprising:

providing a clearance in the bore of the packer as it is set;

allowing a fluid column to act through said clearance during setting of the packer to exert pressure on the formation below the packer for resisting cave-ins into the wellbore.

20. The method of claim 19, comprising:

selectively blocking said clearance in said packer when following fluid in said first direction to deposit gravel in said annular region.